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FEDERAL COMMUNICATIONS COMMISSION

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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of )

)  
Replacement of Part 90 by Part 88 to )  
Revise the Private Land Mobile Radio )  
Services and Modify the Policies )  
Governing Them. )

PR Docket 92-235

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MAY 28 1993

To: The Commission

FCC MAIL BRANCH

Summary

The Commonwealth of Virginia, Department of Health, Office of Emergency Medical Services supports of the Commission's intent to improve spectrum efficiency and simplify the rules governing Private Land Mobile Radio Services. However, many aspects of the Commission's proposal are strongly opposed, including the loss of spectrum which is now dedicated to emergency medical uses; the interspersing of incompatible users in what is now contiguous public safety spectrum; the deletion of virtually all protection criteria; the interim plan to reduce emissions; present plans to space channels closer than 12.5 KHz; creation of high band VHF pairs for innovative shared use; prohibition of future mobile relay operations at high band VHF; the lack of sensitivity to the impact on rural areas; and the proposed time frame for implementation.

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## Table of Contents

Introduction	1
Background	1
Comments	2
Applications and Authorizations	2
Exclusive Use/Assignment Protection	5
Channel/Frequency Assignments	5
Frequency Coordination	6
Very Narrowband Channel Allocations	10
Interim Reduction in Bandwidth	11
Reallocation of Spectrum	15
Limitations to ERP and Antenna Height	18
Technical Standards	20
Operating Requirements	22
Loss of Protection Criteria	24
Restricted Use Frequencies	24
Innovative Shared Use Operations	26
Mutual Aid Operations	27
Paging Operations	27
Fixed Operations	28

### INTRODUCTION

1.) The Commonwealth of Virginia, Department of Health, Office of Emergency Medical Services desires to comment on the Commission's proposal to create a new Part 88 to govern Private Land Mobile Radio Services, and increase spectrum efficiency. The Office of Emergency Medical Services has the statutory authority within the Commonwealth of Virginia to design, implement, and regulate a statewide coordinated emergency medical system<sup>1</sup>. In addition, the Office of EMS is responsible for integrating communications as part of that comprehensive statewide EMS system<sup>2</sup>.

### BACKGROUND

2.) In PR Docket 92-235, the Commission proposes to consolidate the Private Land Mobile Radio Services into a few broad categories; to implement plans which are intended to promote more efficient use of the spectrum, reduce channel congestion, and to decrease the complexity of rules.


3.) The intent of improving spectrum efficiency and reducing channel congestion is supported, but several portions of the proposal may reduce the benefit to future users. Some changes may have an adverse impact on present public safety communications systems if carried out. Others may have a similar effect if not implemented as a result of negative comments received. It is with this in mind that the following specific comments are offered.

COMMENTS

4.) Many areas of the proposed Part 88 seem to lack technical merit, feasibility, or basis. Each section should be subjected to a review by the Commission's Office of Engineering Technology to consider: its technical merit; consistency with similar requirements in other areas (such as bandwidth of emission, frequency tolerances, and power limitations) the feasibility and cost of producing equipment (especially dual mode) to meet the requirement; and the plan to compensate for operations which are presently allowed, but not contained in the new Part 88 (such as mobile relay operations between 150 and 174 MHz).

5.) Many of the requirements which have been placed below 512

applications to combine two or more existing licenses be "coordinated", even with no change in the technical parameters of the stations licensed under either of the original authorizations. The rationale for that decision was that a coordinator needed to review the information provided on the form 574 for accuracy, and compare it with the original authorizations. They also required this action because the new authorization would provide "new" stations under the remaining call sign. This policy decision has discouraged many from attempting to combine authorizations where possible, which would reduce the resulting paperwork and administration costs. Although this specific instance would seem to be exempt from coordination requirements under the new rules, it has not been "interpreted" that way under the present rules which are similar. Such applications which do not change technical



coordinators but would be exempt from coordination. However, the

expired licenses on the system for up to six months, which would provide an indication to coordinators of possible present use. In fact, frequency coordinators have previously used this information to notify licensees of a lapse in their license exactly 180 days after the expiration (when coordination was required and remuneration would result).

EXCLUSIVE USE/ASSIGNMENT PROTECTION

9.) Proposed §88.183 does not protect existing licensees. It merely gives them "co-primary" status. That does nothing to



should be continued and expanded to include all similar channels.

11.) Under proposed §88.245, conflicting terminology is used. New channel pairs are equated to original channel assignments, which may or may not be channel pairs. Licensees who obtain both of the resultant channels (by meeting the efficiency standards at least two years prior to the deadline) will not likely collocate multiple base stations on those adjacent channels. Therefore, few of these licensees will benefit from obtaining the "second channel" unless they utilize non-standard (original) bandwidths with more spectrally efficient techniques.

#### FREQUENCY COORDINATION

12.) Frequency coordination is a matter which was turned over to private entities due to their improved ability to understand user needs, observe local constraints, and cope with implementation problems. Since the time that a single coordinator was designated for each service and allowed to profit from their activities, compliance monitoring has been promised, but is still lacking. Alternative frequency coordination methods, such as field studies and alternate advisors have been removed, creating a monopoly for these services with no actual guidance or oversight.

13.) There is presently a wide variation in the factors used to determine channel reuse. This is reflected in the different protection provided to certain radio services and/or user

classifications. That protection is likely to continue even within a single radio service. While there should be more stringent protection criteria and guidelines for reuse of public safety channels (compared to other services), significant differences should not exist within the proposed radio services. Realistically, disparities will continue to exist even within those groups unless the Commission establishes criteria for coordinators to follow when recommending frequency reuse.

14.) Proposed §88.305(d)(13) would exempt Innovative Shared

common information (such as CTCSS frequencies, antenna orientations, etc.), or "linked" to application specific information which is not of interest to all coordinators. Technology exists today<sup>4</sup> to allow such a repository of common data to exist at a central location, with links to coordinator specific information which would be maintained "locally."

16.) The coordination of frequencies above 800 MHz appears to remain unchanged, and will be handled differently than the "refarmed" channels. **Consistent guidelines and standards of performance/service need to be established for the frequency coordination process.** With those guidelines, it should be possible to obtain frequency coordination from any of the existing (or future) coordinators. If coordination is allowed from multiple coordinators without that foundation, the demand for their services will be determined by cost alone. Those who pay significantly less for inferior services will receive recommendations which may negatively impact users who previously paid more to a "more reputable" coordinator for quality services.

17.) Letters of concurrence are mentioned under §§88.1063(f) and 88.445(b). Letters of concurrence were used when "field studies" were an alternative to frequency coordination. Field studies are not presently an option, but are regularly performed by the applicant independent of, and prior to the official frequency coordination process. Frequency coordinators routinely "require"

letters of concurrence for co-channel users on frequencies which they have recommended as the best possible choice. If letters of concurrence are required by the Commission, then frequency coordination can in effect be done by the applicant, and they should be allowed to file applications directly to the Commission with concurrent notification of applicable frequency coordinator(s). Direct applications, with notification of coordinators would be welcomed if consistent policy and standards are in place.

18.) Fees for frequency coordination do not always reflect the effort required. For the past six years, it has been necessary to pay coordination fees (presently \$150 per simplex frequency) in order to obtain new authorizations on (statewide) designated mutual aid and common use channels in the Special Emergency and (now) Emergency Medical Radio Services. The necessary "coordination"

mobile units in use. Both of these situations defeat the purpose of frequency coordination and station authorizations, but are common due to the costs presently incurred by these minor modifications. **Any rules which encourage the continuation of that practice are not in the public interest.**

20.) The Commission has mentioned during several meetings, the possibility of allocating spectrum to the frequency coordinators, and allowing them much broader oversight and power in assigning those frequencies and resolving interference problems. **The Commission should take a more active role in the process, rather than abdicate its power to private concerns in the private land mobile radio services.**

#### VERY NARROWBAND CHANNEL ALLOCATIONS

21.) The philosophy of the proposed reduction in occupied bandwidth to allow 5 KHz, or even 6.25 KHz channel spacing seems to be similar to a "Field of Dreams<sup>5</sup>." The Commission has proposed these requirements, expects that the manufacturers will somehow be able to produce compliant equipment in all categories, and further expects that users will be able to afford making "wholesale replacements" of their existing equipment and systems. **Channel bandwidths should not be reduced below that achievable in all equipment types.**

22.) Reasonable alternatives which are expected to provide

technical flexibility and increased spectrum efficiency with very narrowband channel spacing may only exist if adjacent channels are combined again (in occupied bandwidth or adjacent channel protection). This brings into question the need for, or advantage of planning (at this time) to split the channels to that degree.

23.) The requirement of 12.5 KHz channel spacing on the National Public Safety Planning Advisory Committee (NPSPAC) channels is presently met with a 20% reduction in deviation and geographic separation of adjacent channel operations. This would be a more favorable approach than the proposed 40% reduction in deviation with no specific guidelines for adjacent channel usage. 12.5 KHz spacing would also be in concert with the present direction of the APCO/NASTD Project 25 activities.

#### INTERIM REDUCTION IN BANDWIDTH

24.) **Bandwidth reductions should not be required of current users absent a clear demand for the spectrum, and a more realistic schedule.** The interim step of reducing the maximum deviation of existing transmitters from  $\pm 5$  KHz to  $\pm 3$  KHz will cause multiple problems for those systems as listed below.

25.) First, the selectivity of the associated receivers is not likely to be reduced. The desired signal will reduce within that bandwidth, but the noise floor (which remains unchanged), and (new) adjacent channel users will degrade signal to noise ratios

significantly. This will especially affect base stations. During previous channel splitting activities, the selectivity of receivers could easily be reduced by replacing the second intermediate frequency (I.F.) filter with a more selective unit. That replacement was simple and quick, normally requiring minimal if any adjustment. The selectivity of today's receivers is distributed throughout several components of the first (and often only) I.F. section. It would be difficult, costly, and time consuming to further reduce the bandwidth of that circuitry. The inability (or cost) to reduce the bandwidth of current receivers will force some licensees to purchase new equipment in order to correct performance degradation, even in the absence of adjacent channel interference from new users.

26.) The second problem is associated with the use of subaudible squelch signalling systems. Those systems presently depend on a transmitted deviation of between  $\pm 750$  Hz and  $\pm 1,000$  Hz for reliable detection. That deviation is not adjustable in many transmitters, and will result in the tone's contribution to the composite modulating signal increasing to between 25% and 33% of the maximum deviation. If the deviation is reduced (in those transmitters which have the capability) by a proportionate amount to between  $\pm 450$  Hz and  $\pm 600$  Hz, operation will likely become erratic, especially with noisy signals, and some receivers will "chop" or fail to unsquelch on weaker signals.

27.) Public Safety systems rely heavily on tone and voice alert paging systems which normally utilize a two tone sequential format. Again, those tones are presently transmitted at approximately 66% of system deviation to minimize distortion from deviation limiting circuitry. The reduction of deviation will reduce the performance of those receivers which are already the weakest link in many systems. It is unlikely that manufacturers will be able to produce hand or belt carried devices with these narrow bandwidth requirements in the foreseeable future.

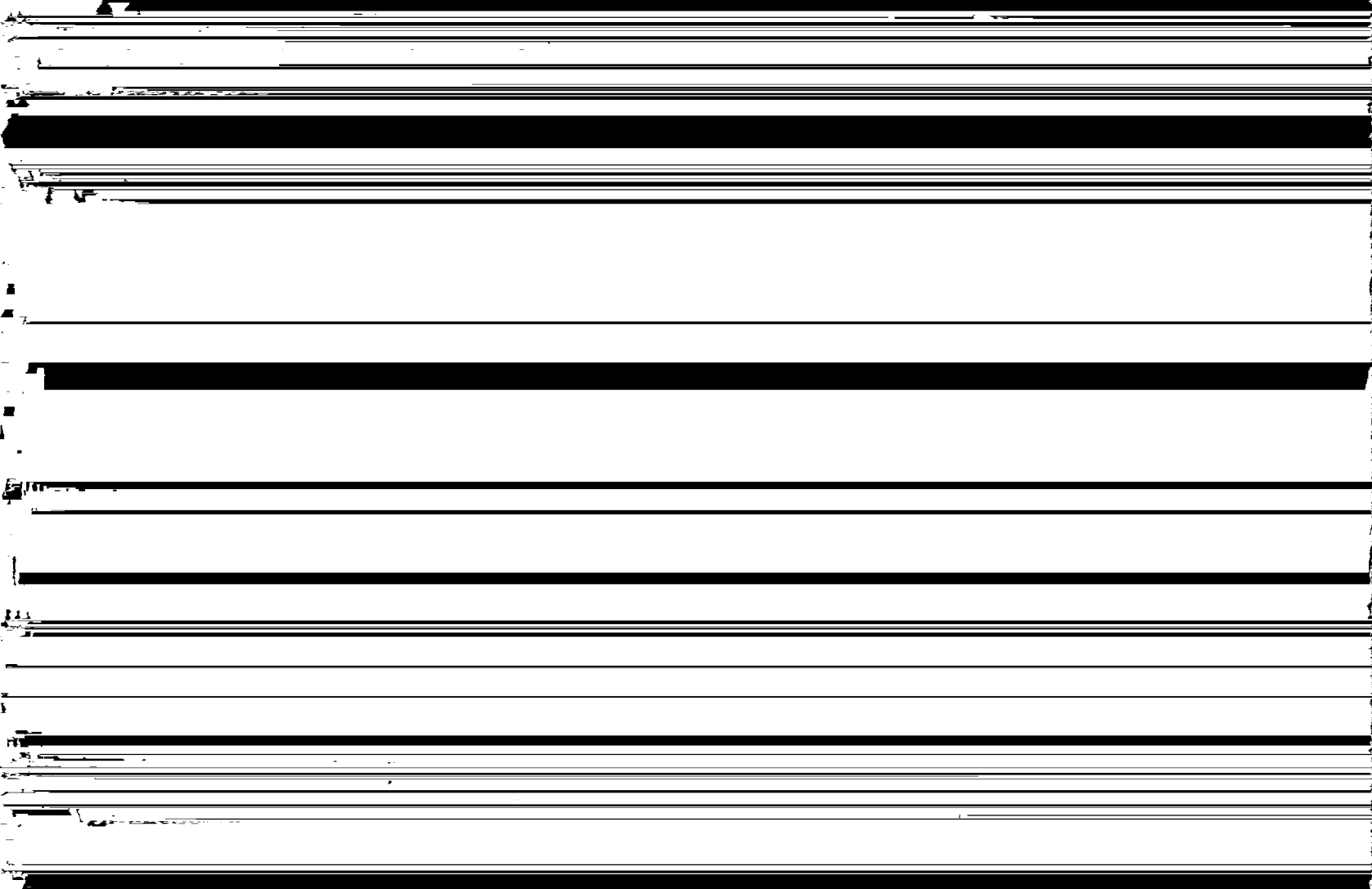
28.) Many EMS radios which operate on the existing MED channels are capable of operating in a multiplex mode when transmitting biomedical telemetry. This multiplex mode allows voice communications to continue while biomedical telemetry is being simultaneously transmitted. In multiplex mode, the deviation resulting from either source (voice or EKG subcarrier) is already substantially reduced (to  $\pm 2$  KHz each). Further reductions will seriously degrade the usability of these systems.

29.) The reduction of emissions will not magically take place in all transmitters simultaneously. Mobile radios in large systems, or ones which routinely depend on mutual aid operations with other departments will notice a significant difference in the volume of received signals during the interim period. This difference will necessitate continual adjustment of volume controls and will hamper reception. The effect will vary between a nuisance



to operators, missed communications due to high ambient noise and low volume settings, auditory discomfort to operators utilizing earphones, and safety hazards<sup>6</sup> where vehicle operators continually attempt to adjust volume controls to compensate for these imbalances.

30.) As stated earlier, it is not effective to reduce emissions and decrease channel spacing without making similar changes in the associated receivers. The fact that several "tone and voice" paging channels will be allowed to continue operating in a wideband mode indicates that the Commission may doubt whether personal tone



equipment cost.

32.) While the technology to manufacture base station equipment might become available within the proposed timetable, miniaturization of circuitry comes after the technology is proven and refined in base stations and mobile radios. The introduction of portable radios for 800 MHz systems lagged behind base and mobile equipment by several years. Trunked features lagged even more, and "trunked pagers" are still not available from manufacturers after more than ten years of technology refinements. Without portable versions of these equipments, public safety communications systems will continue to utilize older technologies and less efficient alternatives. Duplication of equipment to serve personal and portable needs in future systems will offset the benefits of the advanced technologies which will be required of vehicular and fixed stations.

#### REALLOCATION OF SPECTRUM

33.) All "new" spectrum should first be made available to the users of the service in which it is presently allocated. Much of

the ~~new~~ spectrum which will be created from channels in the

present end users in favor of potential markets for entrepreneurial entities.

34.) The high band VHF frequencies which were recently allocated to the Emergency Medical Radio Service, presently receive protection from incompatible users. These frequencies are needed to meet longstanding needs, but will soon be available to all public safety users under this proposal. Because of the nascence of this new radio service, the previous lack of dedicated EMS channels, and the time required to develop comprehensive communications plans and implement wide area communications systems, all spectrum presently allocated to the Emergency Medical Radio Services should be protected from incompatible uses for a period of not less than five years. That protection would allow the design, funding, and development of these systems to take place.

channel will be allocated for innovative shared use, and the upper adjacent channel will be available to all public safety users. While present users will be considered "co-primary" to these new users, no specific protection criteria exists in the proposed rules.

37.) The benefit to be provided by the five 220 MHz channel pairs offered specifically for emergency medical use under the proposal is more than offset by the proposed return of 20 channel pairs from the "refarming" of the present MED channels. **All spectrum which presently exists for emergency medical use in the 150-175 MHz and 450-470 MHz bands should be returned to that same user category.** This would compensate for the lack of channels which has existed for some time, and the likely increase in use of the (present) Special Emergency Radio Service channels when they are turned over to the "non-commercial" category. Designation of that contiguous spectrum (now occupied by EMRS channels) specifically for emergency medical purposes will increase the likelihood of coordinated use, and minimize the chance for harmful interference to this newest public safety radio service.

38.) The 16 channel pairs which will be created from 453/458 MHz spectrum recently allocated specifically to the Emergency Medical Radio Service upon its creation will now be opened to all public safety eligibles, and shared with grandfathered paging operations. This is contrary to the statement made supporting the assignment of



selected to provide maximum coverage and minimal overlap under the present constraints. Those sites will not likely be abandoned because of the significant investments in physical plant, so additional sites would be developed between the present ones. The outcome of "dropping" new sites in between existing ones will be a disproportionate increase in the total number of sites (and base stations) to serve a given area. This will likely result in using one of two methods to minimize problems. Simulcasting<sup>9</sup> will increase the complexity of (and cost to implement and maintain) systems. The alternative of "multi-casting" techniques<sup>10</sup> will necessitate additional channels for an area which could be better served by a single channel if these arbitrary restrictions didn't exist.

42.) Interoperability will be hampered by the proposed changes, especially between local and federal government agencies. As some users "migrate" to new technologies, they will have to equip themselves with dual mode radios, or operate multiple systems to maintain communication with other users which have not yet migrated. The adoption of 5 KHz channel spacing for non-federal systems at high band VHF is an effort to minimize the appearance of impact to existing users. In fact, those existing users will be impacted regardless of the channel spacing used. The use of different channel spacings will also necessitate multiple standards for emission types, modulation methods, and measurement techniques for different bands. **Consistent channel spacings and standards**

should be established.

TECHNICAL STANDARDS

43.) New standards will be required under the proposed rules because of the need to tighten tolerances (occupied bandwidth.

46.) The spectrum efficiency standards provided in proposed §88.433 are inconsistent, do not promote spectrum efficiency above 512 MHz, and actually allow reductions in efficiency on some channels above 800 MHz. The requirement for NPSPAC channels (which are already at 12.5 KHz spacing) seem to be relaxed when applying the spectrum efficiency standards for the use of a non-standard bandwidth. As stated elsewhere in these comments, there is no technical basis for allowing these inconsistencies in spectrum efficiency standards which will result in different technologies, coding methods, occupied bandwidths, and maintenance procedures.

47.) Proposed §88.433(b) discusses data transmission, but is not clear and uses incorrect terminology. Baud rate is related to the number of discrete conditions per second, and affects, but is not equivalent to the bit rate. The bit rate is determined by the baud rate (which is limited by channel bandwidth) and coding efficiency. The wording

*". . . total through-put rate (information net of system overhead) . . ."*

is also confusing and leaves some doubt as to whether "system overhead" is included or excluded from the minimum figure. Efficiency standards should focus on throughput expressed in bit rates (exclusive of system overhead).

48.) The time frame for compliance with the spectrum efficiency standards as shown in §88.433(d) is also optimistic, and will have



an adverse effect on the commonwealth of Virginia if implemented as proposed. Over 35% of the municipal governments, 30% of the land area, and 41% of the residents will be affected by the first phase<sup>11</sup> (2004).

#### OPERATING REQUIREMENTS

49.) Trunked operations below 800 MHz as described in proposed §88.445(b) should not only be allowed, but encouraged for all licensees where possible. **Trunking should be mandated for larger multiple channel systems, with requirements similar to those which presently exist for 800 MHz channels.** This type of trunking should also be possible on the MED channels, but should be required to peacefully coexist with existing conventional operations on those channels<sup>12</sup>.

50.) Proposed §88.737 (e) would require that any channels which are "trunked together" be collocated at a primary site. This would